DVB-T Dongle for VHF/UHF Reception

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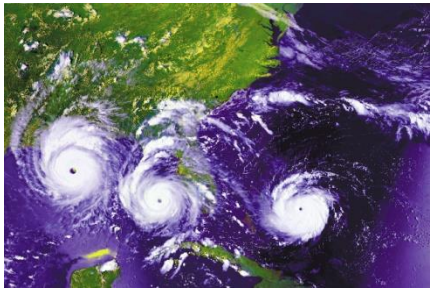
Mario Filippi
N2HUN
m51f08@yahoo.com

VHF/UHF Reception

- FM Broadcast: 88 - 108 MHz
- Police, Fire, EMS: ~ 150 - 155, 470, 500, 800 MHz
- Railroad, NYC transit: ~ 160 – 162 MHz
- Aeronautical: 108 – 136 MHz
- Taxis: ~ 150 – 151MHz
- NOAA Weather: 162.4 – 162.55 MHz
- GMRS/FRS: ~ 462 – 467MHz
- Marine VHF: ~ 156 – 157 MHz
- Business Bands: ~ 150, 470 MHz
- Amateur Radio: 50 – 54, 144 – 148, 219 – 220, 222 - 225 , 440 – 450, 902 – 908, 1240 – 1300 MHz
- Power and Light Utility Companies: ~936 MHz
- 30 – 50 MHz (VHF Low Band): Mix of police, fire, EMS, military, taxis, businesses



What is a DVB-T Dongle?

- Thumb-size broadband receiver
- Runs off USB port of computer
- Runs on 5V from USB port
- Used for television reception in countries outside of USA
- Adapted for use as a broadband rcvr for hobbyists
- Cheap way to monitor VHF/UHF bands
- Can view 2 MHz wide portion of spectrum
- Requires software
- All modes supported: AM, FM, USB, LSB, CW (even DRM) – depends on software

Where Can I Purchase A Dongle?

- Direct from company such as Nooelec.com
- Amazon
- Ebay
- Prices range $13 to $60+
- Not available in traditional bricks and mortar stores
- When searching ‘Net use “DVB-T dongle” or “RTL-SDR” as search string

Points to Ponder Prior to Purchase

- Budget constraints
- Need computer with USB port
- Soundcard
- What software will I use? SDR#, HDSDR?
- Frequency coverage- i.e. what do I want to hear?
- Antenna, coax
- Need proper coax adaptor – PAL or MCX ?
- Ear buds or headphones
- Reputable vendor or pig in a poke?
- Need Internet access for downloading of programs

Caveat Emptor

- Dongle is a consumer product for ex-USA market
- Designed for TV/Radio reception outside US, e.g. Europe, Africa
- Video format is for ex-USA
- Documentation included with dongle refers to is for use as TV/Radio only
- Use as an SDR rcvr is not original intended use
- At moment, cannot scan memory channels
- Specifications e.g. sensitivity, selectivity, spurious signal info e.g. “birdies” may not be documented
- Schematics may not available

What Accessories Come with the Dongle?

- Manual/pamphlet for use as a OTA DVB-T receiver
- CD-ROM with drivers (**Do not load drivers from CD!!!!!)**
- Mini- mag mount antenna
- USB pigtail
- Sometimes a remote is included.
- Note that in some instances you can purchase a dongle alone – always check with the seller as to what exactly is included!

Example of Two Different Dongles Purchased

CD for OTA TV reception ex-USA

Mini-mag mount antenna

DVB-T dongle 64 – 2400 MHz

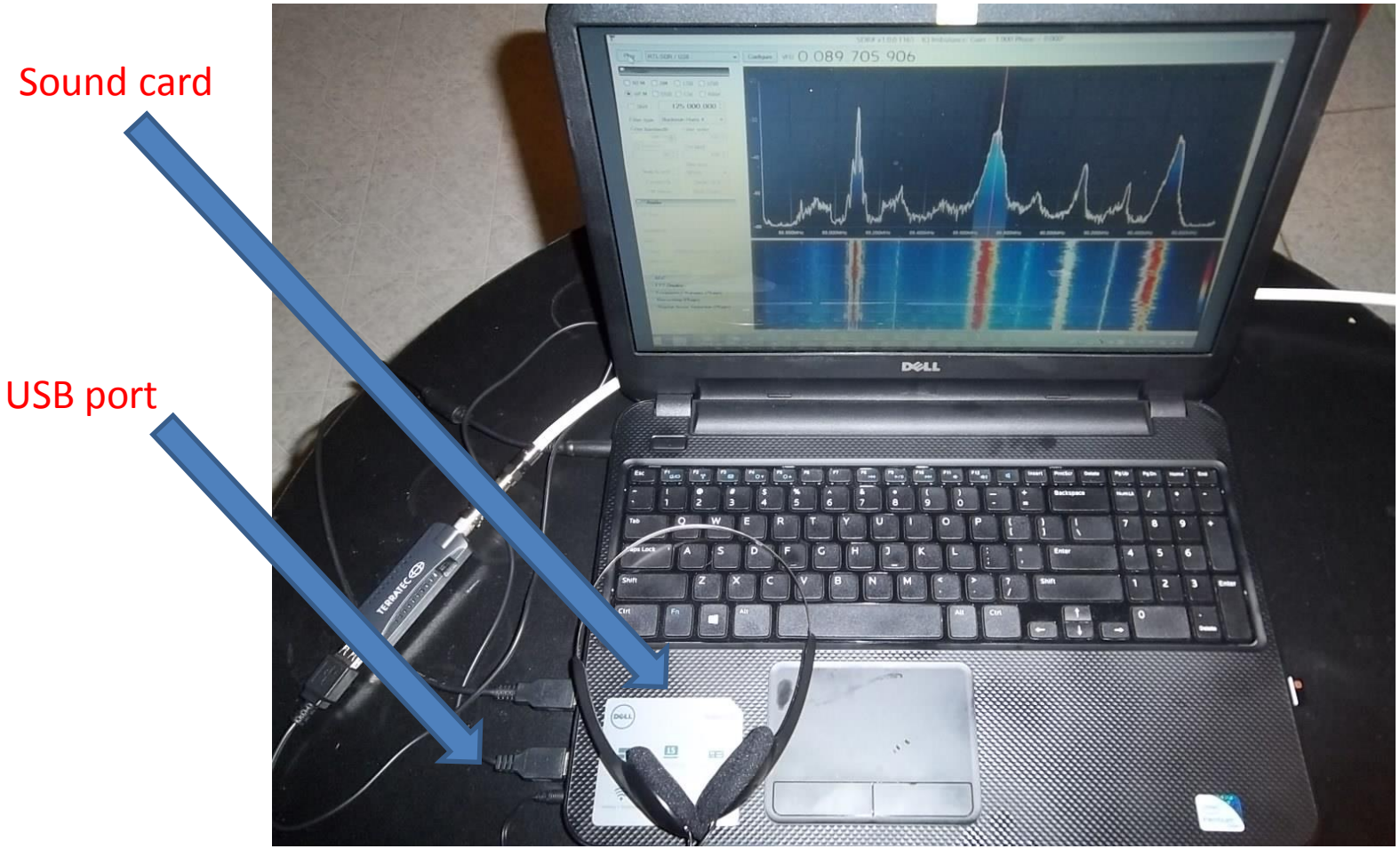
USB cable

User manual

Remote control

DVB-T dongle 22– 1000 MHz

What Else Do I Need?



Correct coax adaptor

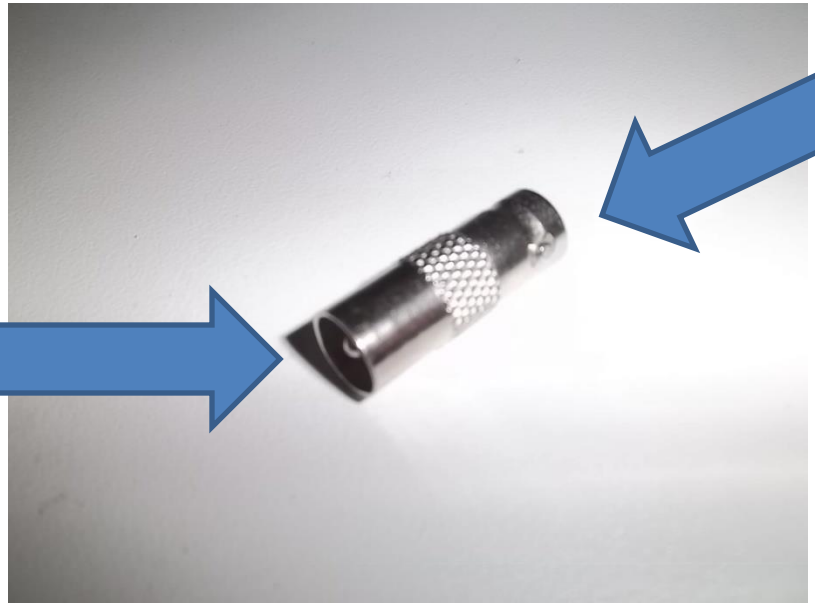
Need the correct adaptor if you are going to use an antenna other than the mini antenna that was included

PAL connector

Dongle

BNC to PAL adaptor

This end attaches to coax cable with male BNC



This end plugs into dongle

Antenna- Buy or Build?

General rule: the higher the better, the bigger the better, outside better than inside! Use low-loss coax for long runs!

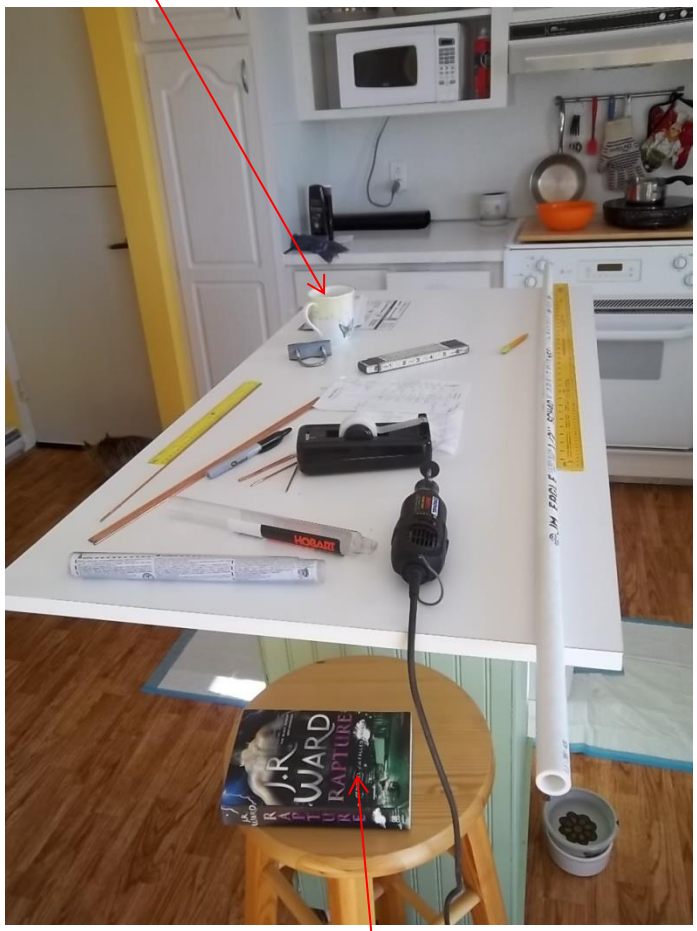
Homebrew ground plane 150/450/800 MHz

Store-bought scanner antenna

Homebrew 6 element beam for 900MHz

Home brewed antennas for scanning

Cup of Java



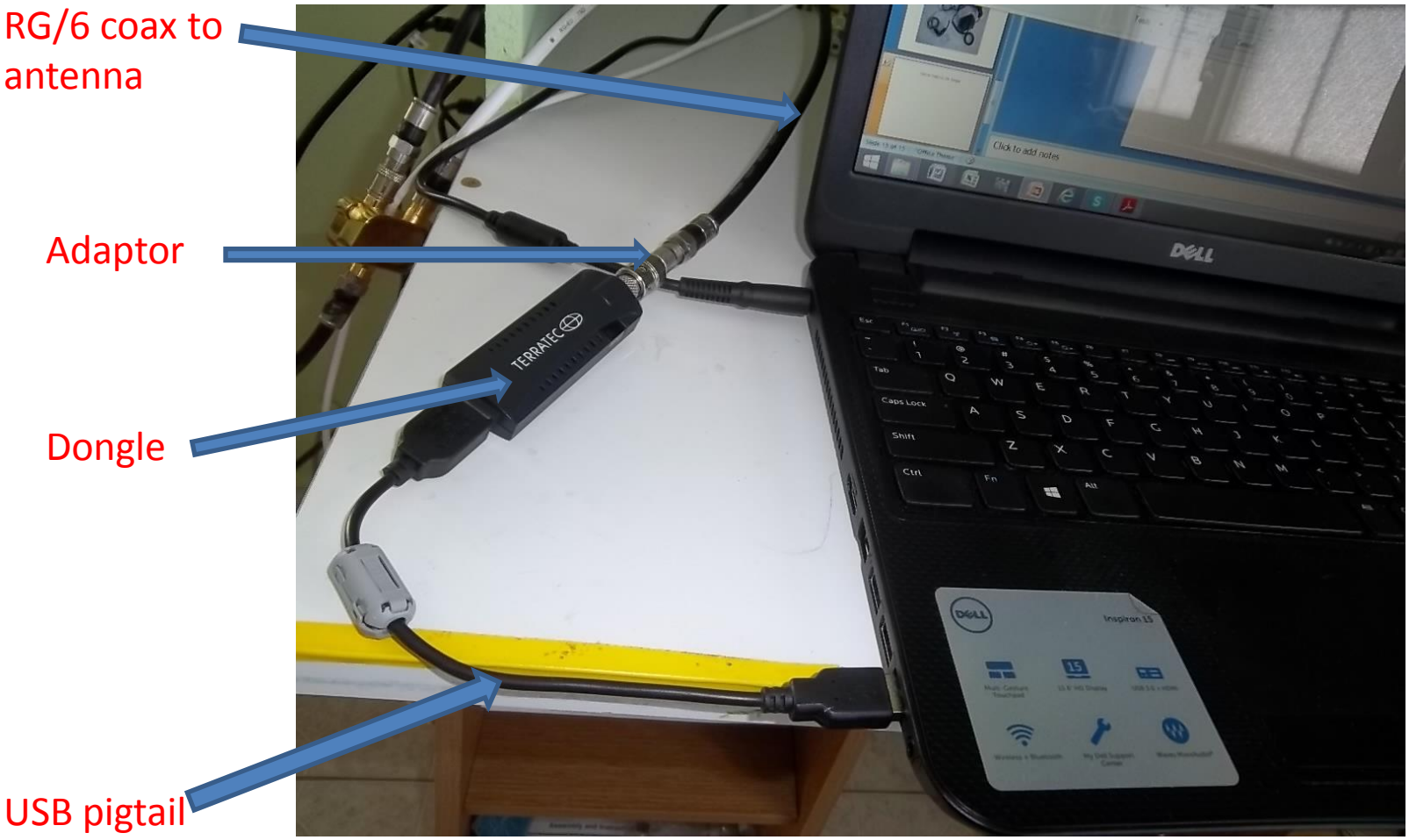
Reading material

6 element 450 MHz beam

8 element 800 MHz beam

Headphone/Ear buds

How to Hook Up the Dongle



Software Requirements

- Driver software – for the dongle
- Program software – to run the SDR dongle

What Software Package Can I Use for My Dongle?

- Software choice is a personal choice/preference
- Go on Internet – gather information
- First check out YouTube videos on using a DVB-T dongle – many out there
- Yahoo or Google search on DVB-T dongle
- Check www.hamradioscience.com
- Some vendors will have information on software
- Search string " SDR Sharp" or "HDSDR"
- SDR# and HDSDR are two most popular programs to use with dongle
- Others programs may be out there for use!
- Website for SDR#: www.sdrsharp.com
- Website for HDSDR: www.hsdsr.de
- Software downloads are free – but download from a reputable site! Beware of viruses!
- SDR# and HDSDR work very well
- NOTE: You have to download and install proper driver first! Do not use the driver on the CD that came with dongle!!!!!

Software (cont'd)

- Recommend using SDR# or HDSDR
- Driver program is Zadig
- Install driver program first with dongle in USB port
- Some computers will "memorize" driver program for a particular port so don't play "musical chairs" with dongle – keep in in the same USB port where driver program was installed
- If you change dongles, you may have to reinstall driver
- Prior to downloading and installing any of the programs, know what your OS is!
- Have used HDSDR and SDR# with Win XP and Win 8

Software Installation Scenario

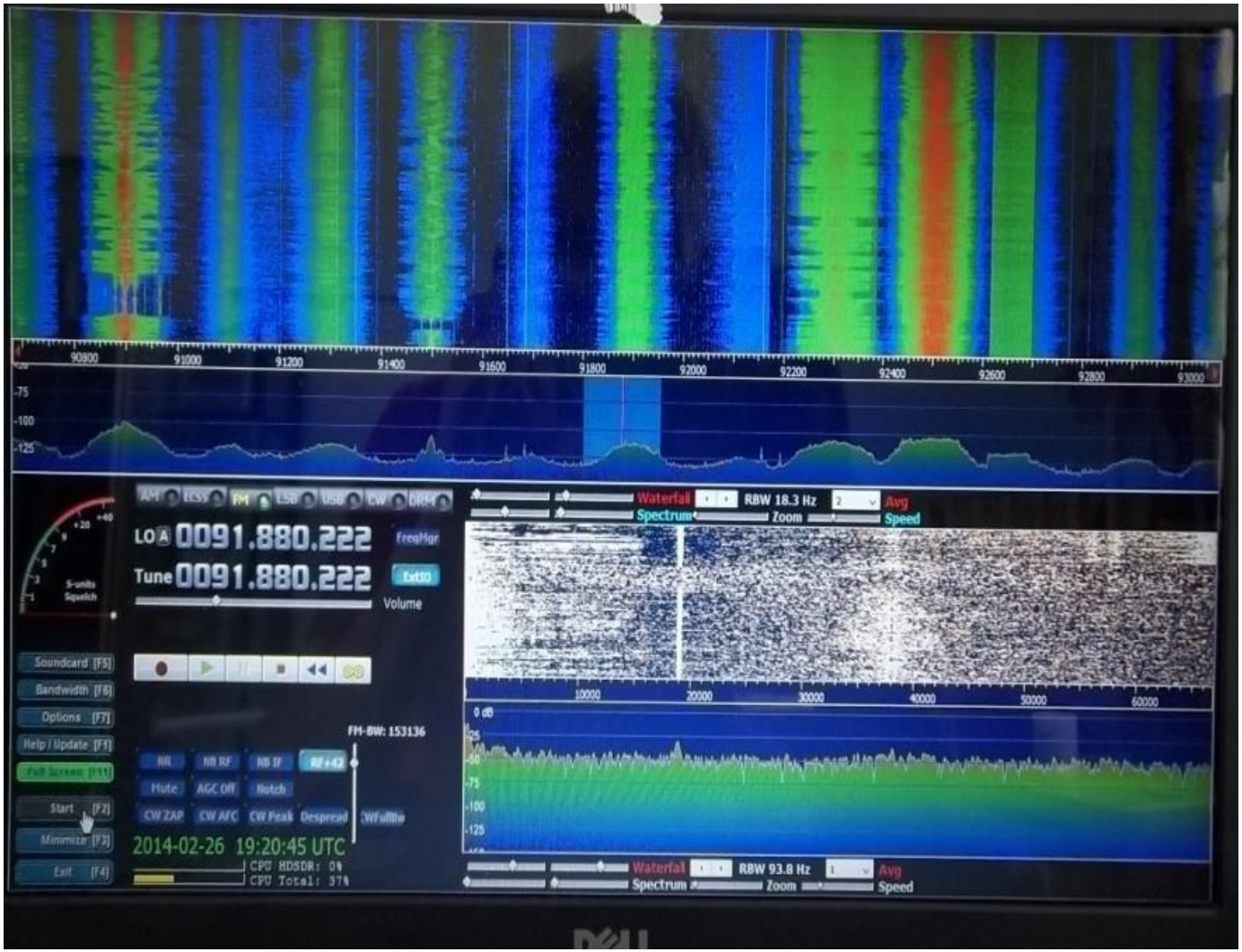
•Go to appropriate website, e.g. HSDSR or SDR#
• READ THE INSTRUCTIONS CAREFULLY!
• Download the driver and appropriate software version from the site and install on your computer
• Fire up the dongle and have fun!
• Note that Windows 8 has driver signature enforcement – there is a work-around for that – don't get nervous! It' ll work!

Using Dongle on VHF/UHF

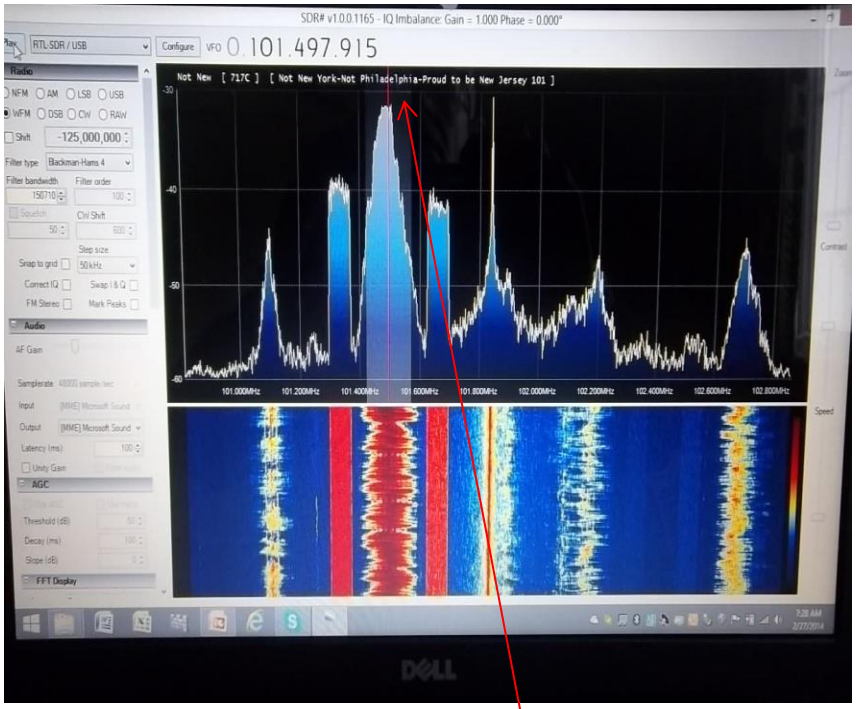
- Aero monitoring on 108 – 136 MHz using AM (Amplitude Modulation)
- FM broadcast band on 88 – 108MHz using WFM
- Police, Fire, EMS on 150, 460, 500, 800 MHz using NFM
- NOAA weather on 162.4 – 162.55 MHZ FM
- Hams on 146, 220, 440, 900, 1200
- VHF Marine 156 – 158MHz
- During emergencies and inclement weather VHF/UHF bands are busy

FM Broadcast Band: 88 – 108 MHz

(Good place to initially test dongle)

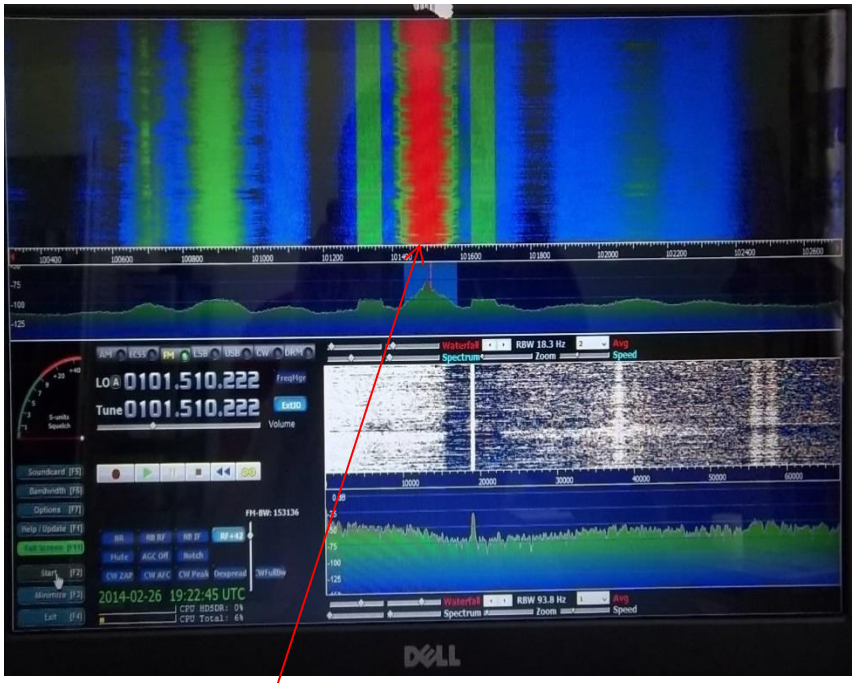


FM Broadcast Band: SDR#, HDSDR



SDR#

Note: SDR has RDS

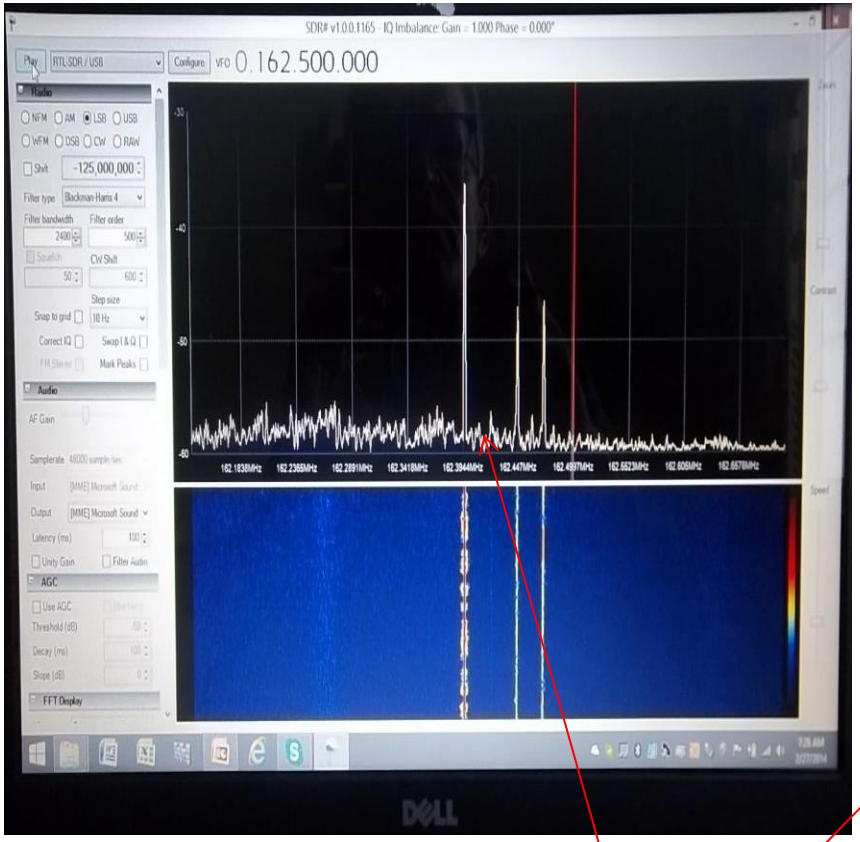


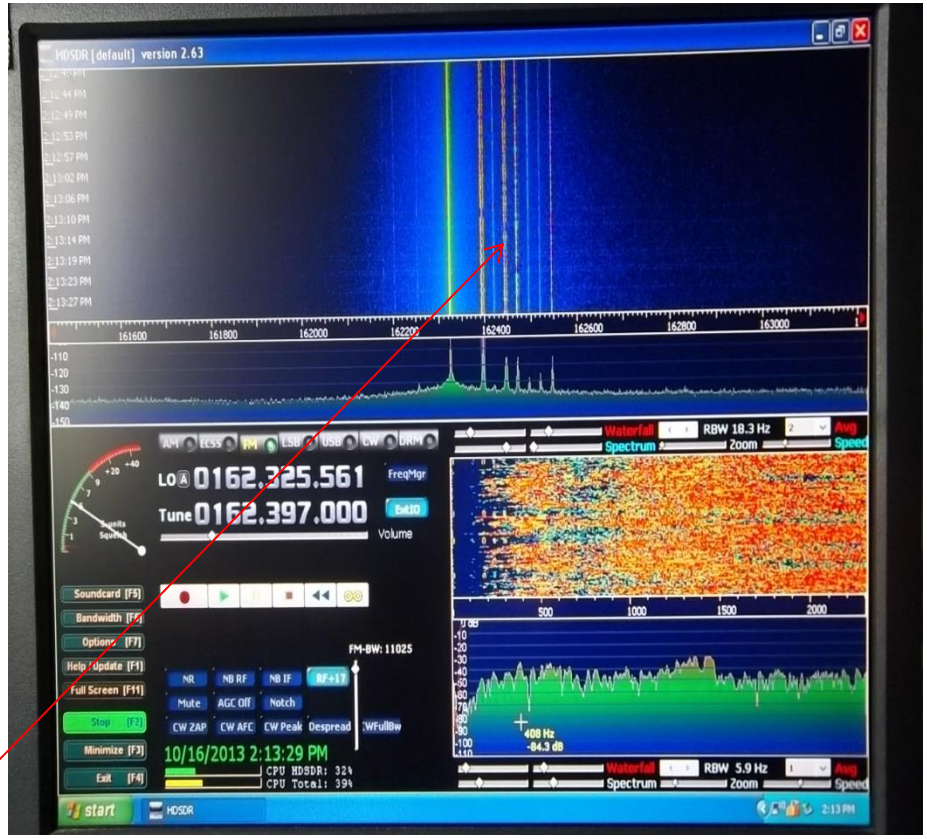
HDSDR

New Jersey 101.5

NOAA WX Band: 162.4 – 162.55 MHz

(Another good band to test out dongle)



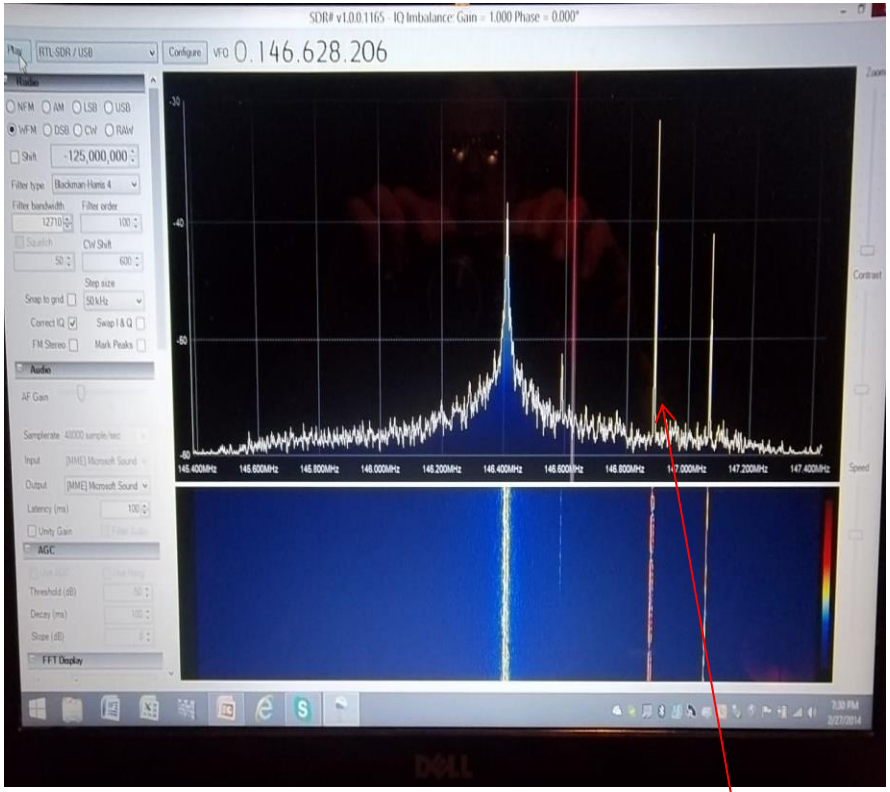


SDR#

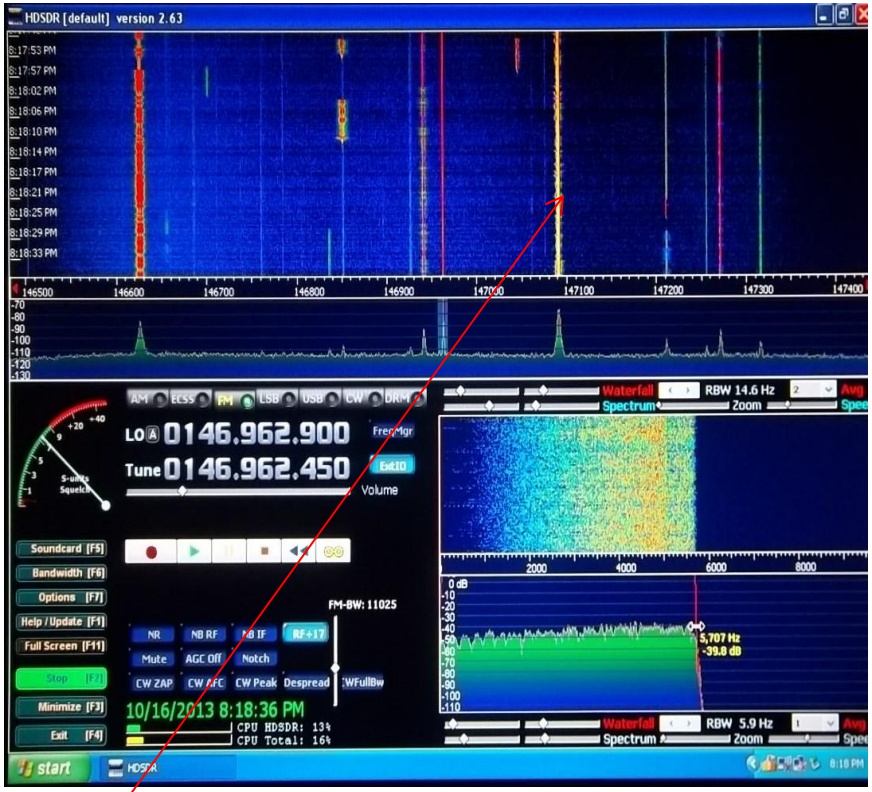
HDSDR

NOAA wx stations from NJ, PA

2 Meter Ham Band 144 – 148 MHz



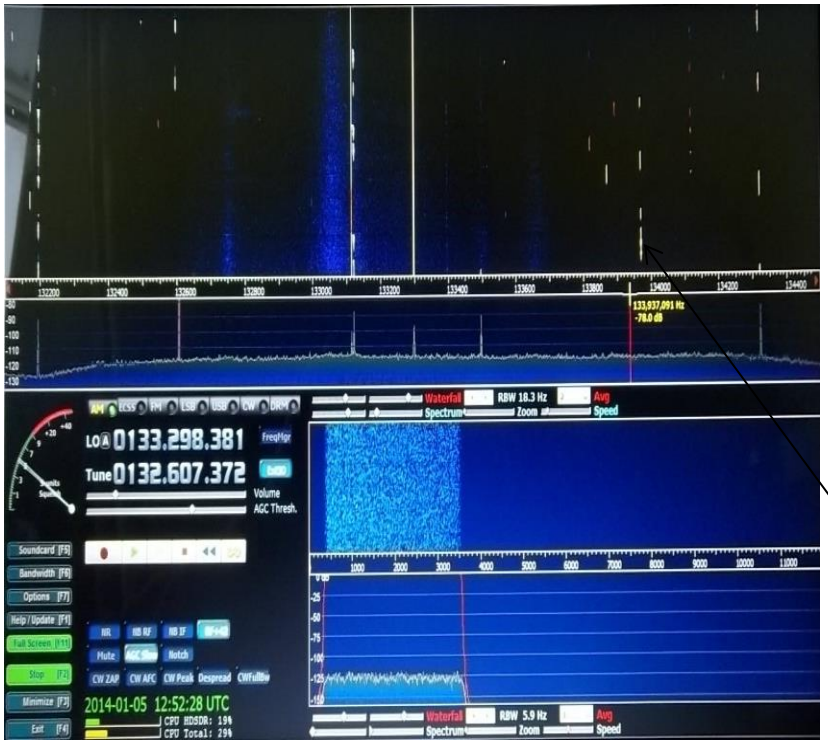
SDR#

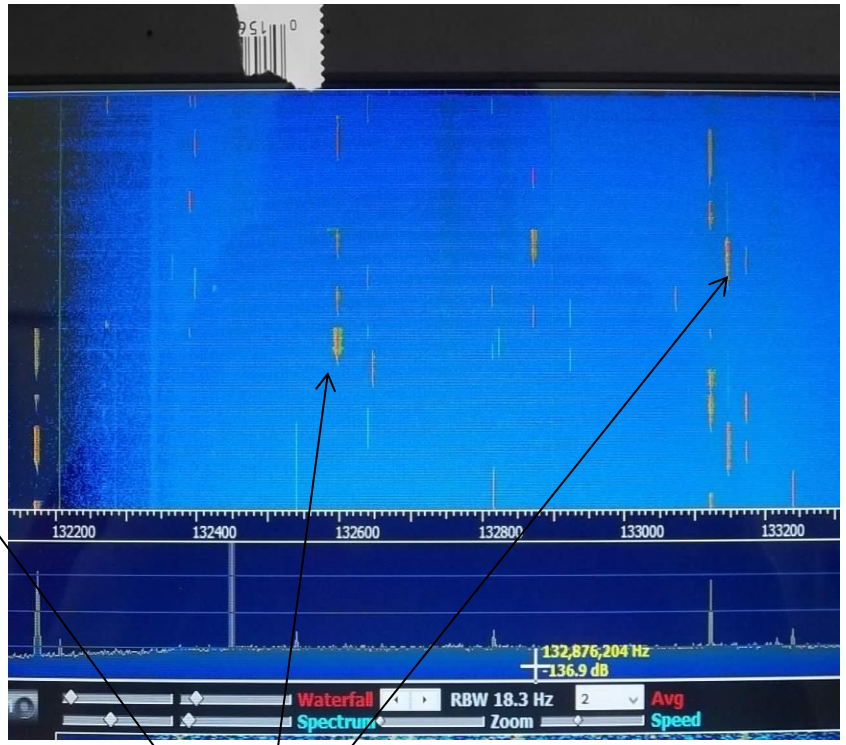


HDSDR

Hams having QSO's

VHF Aero Band: 108 – 136 MHz

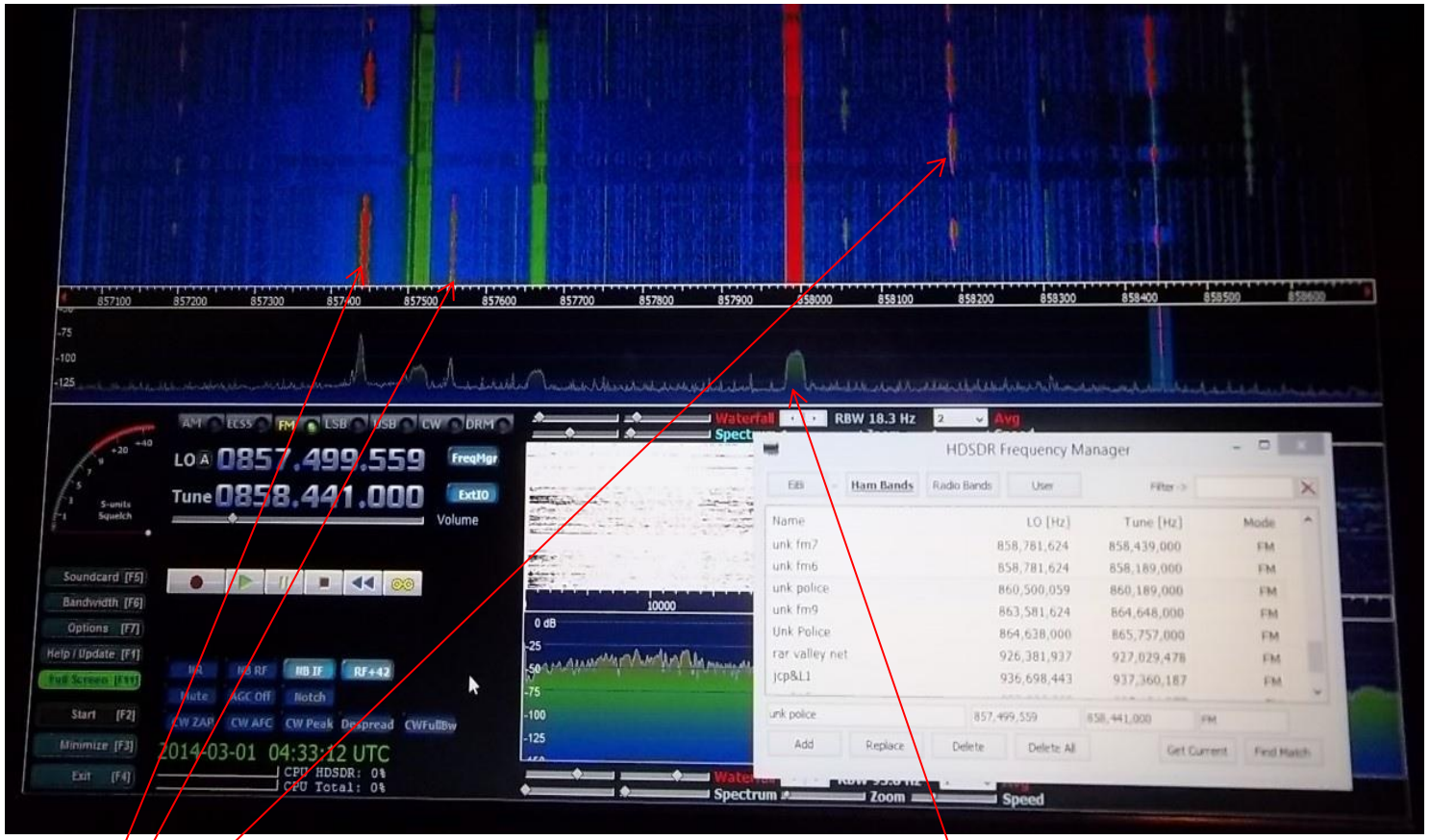




Pilot & ground station comms

Note: VHF aero band uses AM (Amplitude Modulation!

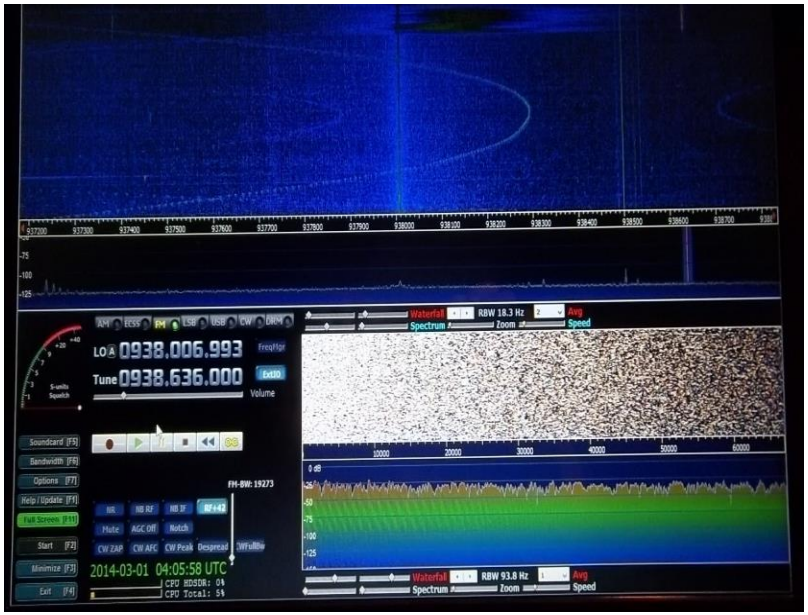
800 MHz Band and Beyond

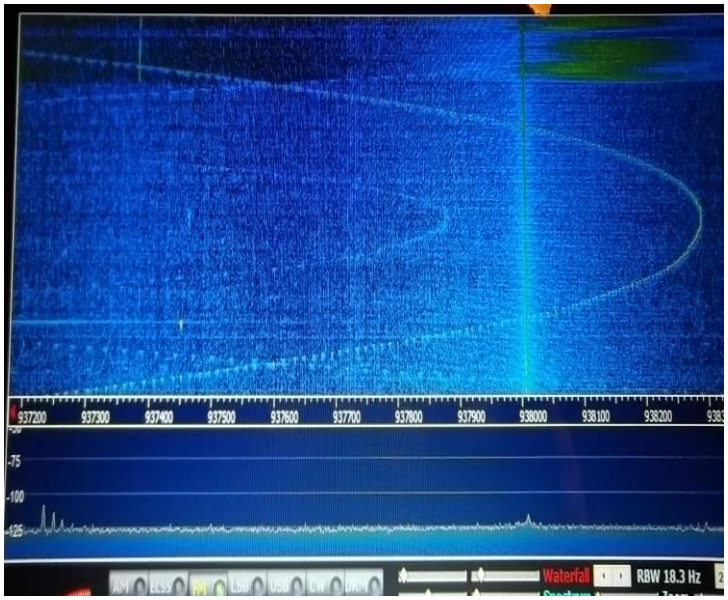


Voice comms

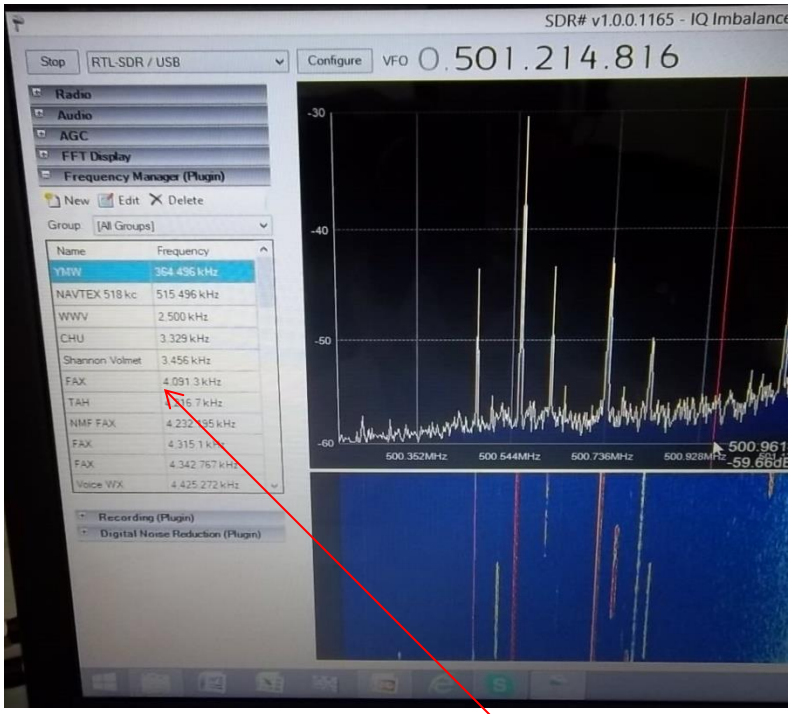
Unknown (data, telemetry, appliances?)

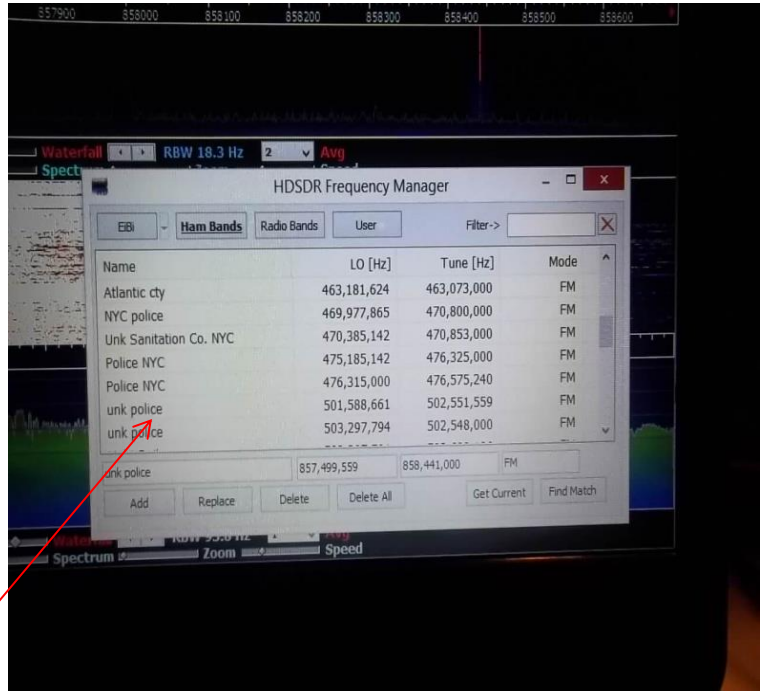
? Signals


LO 0938,006,993
Tune 0938,636,000
Volume
RBW 18.3 Hz
Waterfall
Spectrum
Zoom
Speed
RBW 93.8 Hz
2014-03-01 04:05:58 UTC


RBW 18.3 Hz
Waterfall

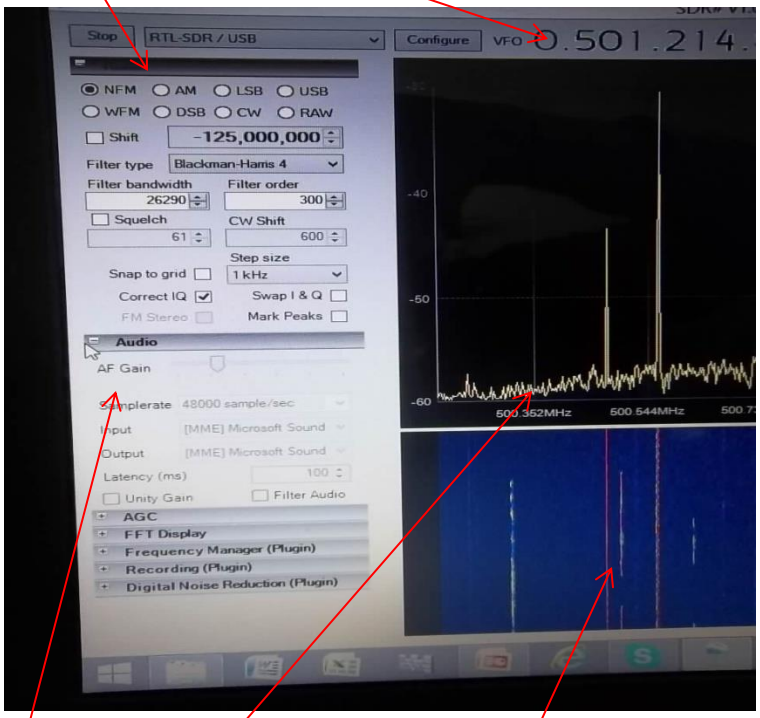
Software features

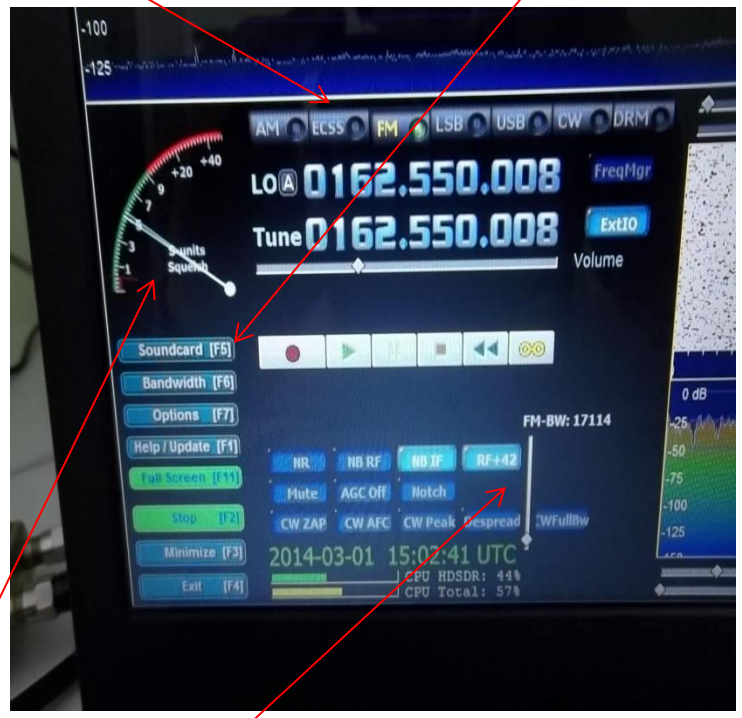




Frequency manager – stores frequencies of interest into memory

Software Features





Informational Resources

- The Spectrum Monitor Magazine www.thespectrummonitor.com
- SDR# www.sdrsharp.com
- HSDSR www.hdsdr.de
- HamRadioScience www.hamradioscience.com
- Nooelec www.nooelec.com
- Past issues of Monitoring Times Magazine
- www.rtl-sdr.com
- Articles in QST Magazine
- YouTube videos www.youtube.com
- www.amazon.com (check buyer feedback)
- www.ebay.com
- Monitoring Times back issues

Other SDR Dongle Applications

- Long wave/Medium wave/ Shortwave radio using up-converter
- Monitor ADS-B transmissions (1090 MHz)
- Virtual Radar (January QST)
- Satellite finder (YouTube)
- INMARSAT reception